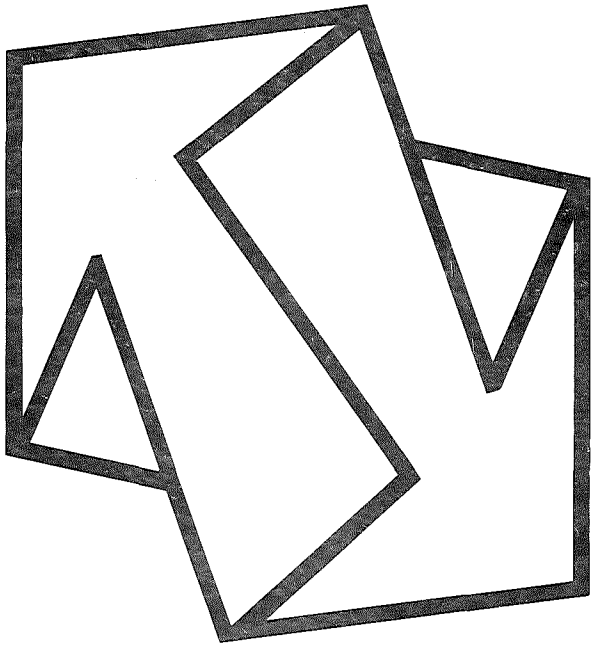
REVISED

1984 BASELINE PROJECTIONS

EXECUTIVE SUMMARY



STATE OF UTAH

OFFICE OF PLANNING AND BUDGET

116 STATE CAPITOL BLDG. • SALT LAKE CITY, UTAH 84114

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INTRODUCTION

Under the leadership of the Utah Office of Planning and Budget's Data Resources Section, a completely new projection of "Baseline" or "most likely" economic and demographic conditions, through the year 2010, for the State of Utah, its counties, and its multi-county planning districts (MCD's) has been prepared. This Executive Summary presents a brief sketch of this projection and of its underlying analytical techniques and critical assumptions. Detailed discussions of procedures and assumptions, and of the projections themselves, are presented in the full report titled, Utah 2010.

It is the goal of the Office of Planning and Budget (formerly the goal of the Office of the State Planning Coordinator) to attempt to coordinate the planning of state agencies. OPB believes one of the most effective ways to achieve this goal is through the use of up-to-date, reliable and consistent data. Consistency among basic assumptions and data is a necessary component in an evaluation and analysis of state agency planning and budgeting. In December 1978, Governor Matheson, in order to achieve consistency in planning, directed state agencies to use the population projections provided by the State Planning Coordinator's Office. The primary purpose of this report is to make available to state agencies updated population projections for planning and budget purposes in an effort to achieve planning coordination. It is also hoped that local governments and private industry will also utilize the projections to further achieve planning coordination. It is the current policy of the Office of Planning and Budget, beginning in 1985, to provide annual updates of population projections.

This projection is called "Baseline 1984." A baseline projection reflects the future based on the existing economic structure of the area and the changing demographic characteristics of the population. The baseline is not a prediction or forecast of the future but rather an attempt to depict the direction current trends are likely to take without major changes in the economic base. For example, Baseline 1984 does not assume synfuels development will occur nor projects like the nuclear waste repository in Southeast Utah. On the other hand, neither does it assume that Kennecott or Geneva steel will shut down operations. Alternative projections which assume these events can then be compared to the baseline projection to determine their impact. Characteristic of the baseline projection are declining growth rates over time. It is assumed that with a given economic structure, an area will begin to stabilize over the years as the economy matures.

These new baseline projections represent the work and thought of many people. The project has involved extensive refinement of the procedures and analyses used to calibrate the Utah Process Economic and Demographic Model (UPED) --the model OPB has used for many years to generate both baseline and impact type projections (a more complete description of UPED is found in the Appendix). It has also involved extensive initial data gathering both to update data sources previously and routinely used and to discover and incorporate a number of sources not previously utilized. Also, major advancements have been made in computerizing the process itself.

Generation of initial input data assumptions involved personnel representing a number of state agencies including the Bureau of Health Statistics, the Department of Employment Security (Job Service), and the University of Utah's Bureau of Economic and Business Research. Once initially estimated, these assumptions were subjected to review by other state agencies, multi-county Associations of Governments (AOG's), and county and city officials and planners. As a result of these reviews, the input assumptions were adjusted where appropriate to reflect reviewers' concerns and specialized knowledge. In this sense, this projection represents a consensus best estimate of future conditions as generated by the UPED Model when "fed" the assumptions resulting from this extensive analytical-judgmental process.

SUMMARY OF BASELINE 1984

The following subsections represent a brief sketch of the more salient aspects of Baseline 1984.

State and Multi-County Planning District (MCD) Population Growth

Figure 1 presents a schematic representation of the state and MCD population projections of Baseline 1984. Table 1 presents the data upon which Figure 1 is based and also the percentage distribution among MCD's and the total state population. As Figure 1 shows, all parts of the state are expected to participate in population growth (and its underlying economic expansion) through the next twenty five years. This growth is not uniformly distributed, however. In growing from a 1980 population of 56,050 to 107,500 in 2010, the Southwestern (Five County) MCD is projected to grow at an annual growth rate of 2.2%. This is the fastest average growth rate of all the MCD's. At the other extreme, the Southeastern MCD shows an annual average growth rate projection of 1.4% in growing from 54,650 in 1980 to 82,600 in 2010.

The State as a whole is projected to reach a population just over 2,681,000 in the year 2010. This represents an average annual rate of growth of 2.0% from the July 1, 1980 population of 1,474,000. This is a rate more than double the national growth rate over the same period. As Figure 1 shows, this 2.0% growth per year average is not evenly distributed throughout the three decades between 1980 and 2010. The first fifteen of those years are projected to experience growth rates greater than 2.0% per year with the peak five-year period being the 1985-90 period. After 1995, growth rates fall below two percent per year, reaching a minimum of 1.3% per year in the 1995-2000 period and increasing slightly thereafter.

The decade of the 1970's saw a slight decline in the proportion of state population residing in the Wasatch Front MCD. Baseline 1984 projects a reversal of that trend with the Wasatch Front attaining a greater proportion of state population than it constituted in 1970. The Southwestern (Five County) MCD is the only other MCD projected to increase its share of the State total while the Central (Six County) and Uintah Basin MCD's retain roughly constant shares. The Bear River, Mountainland, and Southeastern MCD's are expected to grow more slowly than the State average, and thus to constitute a smaller proportion of the total in 2010 than they did in 1980.

TABLE 1
BASELINE POPULATION PROJECTIONS BY MCD*
1970–2010

MCD	1970	1975	1980	1985	1990	1995	2000	2005	2010
Bear River	72,300	79,700	93,350	106,500	121,200	131,800	139,900	149,800	163,600
Wasatch Front	713,350	804,600	948,950	1,058,200	1,230,200	1,378,200	1,490,700	1,630,400	1,803,000
Mountain lands	151,150	191,300	239,400	271,300	309,700	325,100	326,900	344,600	379,100
Central	35,400	40,400	47,500	63,600	67,600	67,400	72,000	79,400	85,000
Southwest	35,650	44,400	56,050	65,600	72,800	79,800	87,200	96,400	107,500
Uintah Basin	20,850	29,650	34,100	40,700	46,700	49,300	51,700	55,600	60,300
Southeast	37,200	43,950	54,650	59,700	64,200	68,100	70,300	75,300	82,600
Total	1,065,900	1,234,000	1,474,000	1,665,600	1,912,400	2,099,700	2,238,700	2,431,500	2,681,100

PERCENT OF STATE POPULATION

MCD	1970	1975	1980	1985	1990	1995	2000	2005	2010
Bear River	6.8	6.5	6.3	6.4	6.3	6.3	6.2	6.2	6.1
Wasatch Front	66.9	65.2	64.4	63.5	64.3	65.6	66.6	67.1	67.2
Mountain-lands	14.2	15.5	16.2	16.3	16.2	15.5	14.6	14.2	14.1
Central	3.3	3.3	3.2	3.8	3.5	3.2	3.2	3.3	3.2
Southwest	3.3	3.6	3.8	3.9	3.8	3.8	3.9	4.0	4.0
Uintah Basin	2.0	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.2
Southeast	3.5	3.6	3.7	3.6	3.4	3.2	3.1	3.1	3.1
Total**	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*All estimates and projections are as of 1 July.
**Total may not add due to rounding.

FIGURE 1

MULTI-COUNTY DISTRICTS
1980-2010 POPULATION CHANGE

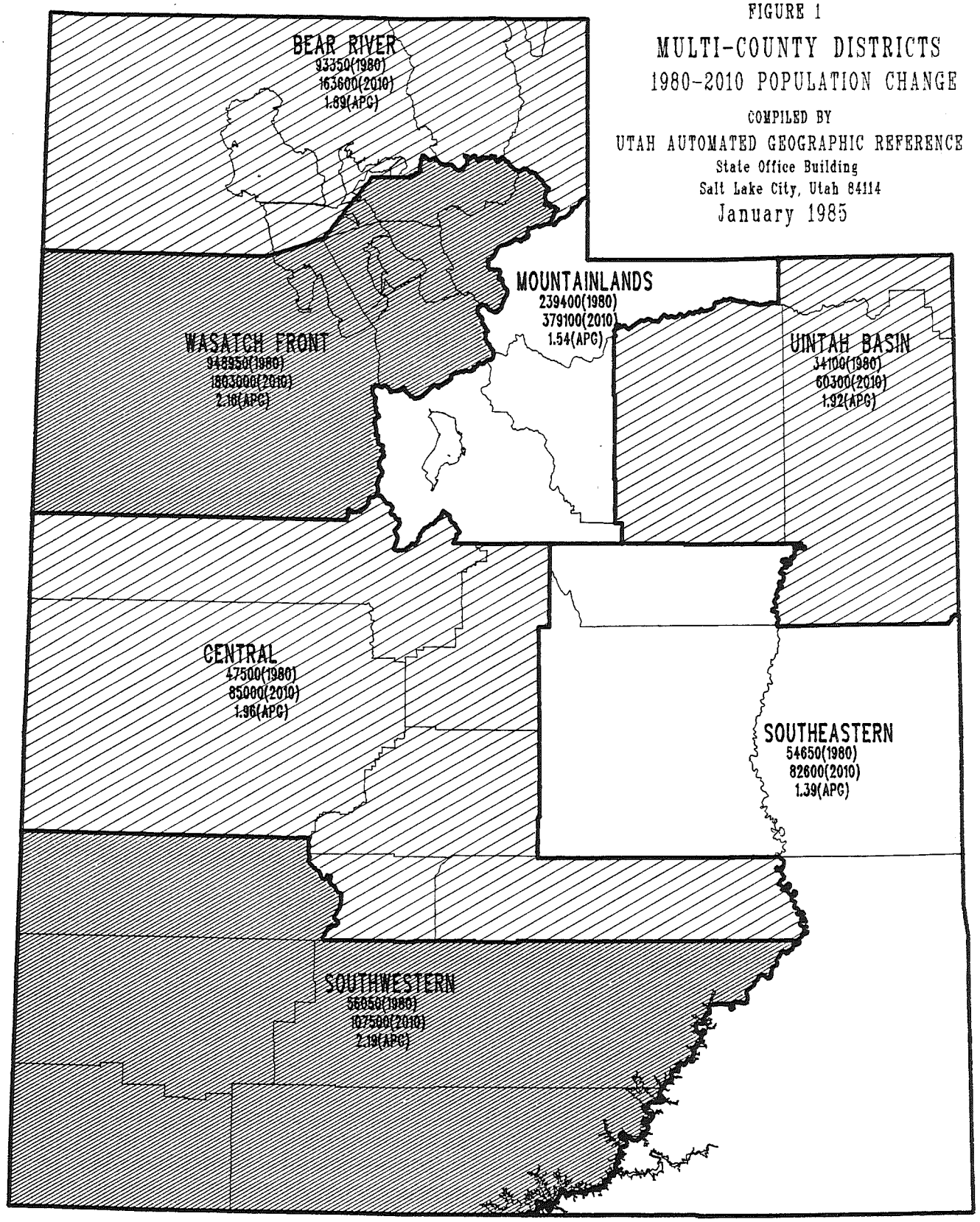
COMPILED BY

UTAH AUTOMATED GEOGRAPHIC REFERENCE

State Office Building

Salt Lake City, Utah 84114

January 1985



EXPLANATION

2.1% - 2.2%

1.7% - 2.0%

0.0% - 1.6%

MCD NAME
1980 POPULATION
2010 POPULATION
AVE. ANNUAL % GROWTH

PRIMARY SOURCE MAP:
U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS, 1980

POPULATION DATA:
UTAH OFFICE OF PLANNING AND BUDGET
DATA RESOURCES SECTION

Components of State Population Change

Births

Population change in any area over time results from three phenomena: (1) Births, (2) Deaths, and (3) Net In- or Out-Migration. Utah's birth rate has historically been the highest in the nation and has, in fact, recently shown a slight tendency to increase even though the national rate is trending downward. A critical assumption in Baseline 1984 is that Utah's "completed cohort fertility," i.e., the number of children a woman is likely to have during her lifetime, will remain constant. The statewide average is 3.1393, its 1980 level, with slight variations among MCD's reflecting historical differences. This assumption represents an important revision from previous Baseline calibrations when it was assumed that Utah's fertility behavior would follow the national trend downward. Recent indications are that such a decline cannot be documented. Of secondary importance here is the change in timing of births. A higher proportion of women tend now to put off births to later years than was earlier the case. Paradoxically, a marked increase in late teenage birth rates has also occurred. Therefore, the rates of the early 20's age groups, although still the peak child-bearing ages, are somewhat lower than in earlier calibrations with corresponding increases in late-20's and early-and late-30's fertility rates and also in the fertility rates of the late-teenage years. These fertility rates result in a total of almost 1,488,000 births to Utah residents projected for the period 1980-2010. As Table 2 and Figure 2 show, the number of births increased rapidly during the 1970's and is projected to taper off between 1980 and 2000. From 2000 to 2010, another surge of births is expected as another generation ages into the prime child-bearing years. Table 3 and Figure 3 shows graphically this process of changing age structure of the State's population.

Deaths

As Figure 2 shows, the number of deaths in the State is expected to rise continually through 2010. The number of deaths per year increases at an annual rate of 2.89%, well above the population growth rate. The number of deaths per 1000 population increases from 5.50 per year in 1980 to 7.11 per year in 2010. This increase occurs despite the fact that survival rates for each age level are assumed to remain constant. The reason for this increase is that the population as a whole becomes more heavily concentrated in the older, lower survival rate age groups. For example, in 1980, 10.5 percent of the population was 60 years old or older. In 2010, this group is projected to increase to 12.9% of the total.

Net Migration

Migration is typically the most volatile component of population change. As Figure 2 shows, Baseline 1984 is no exception to this rule. Migration varies with economic conditions and with demographic changes. From 1980 to 2010, a total of 151,000 net in-migration is expected in the state (i.e., in-migration is expected to exceed out-migration by 151,000). The year of peak net in-migration is 1988 with a total of 18,300. A period of net out-migration occurs around the turn of the century, reaching a peak of 10,000 in 1996. Out-migration is created when the economy is not growing fast enough to provide jobs for the growing labor force. Population growth frequently occurs during periods of out-migration. This period of out-migration is followed by another period of net in-migration during the first decade of the 21st century.

TABLE 2

STATE OF UTAH
BIRTHS, DEATHS, & MIGRATION

YEAR	BIRTHS	DEATHS	MIGRATION
1970	26953	7063	15260
1975	31667	7519	14002
1980	41786	8103	12217
1985	41865	9426	11184
1990	44482	11575	15413
1995	46172	13631	-353
2000	48915	15409	-2906
2005	54687	17185	5336
2010	61284	19069	14297

FIGURE 2

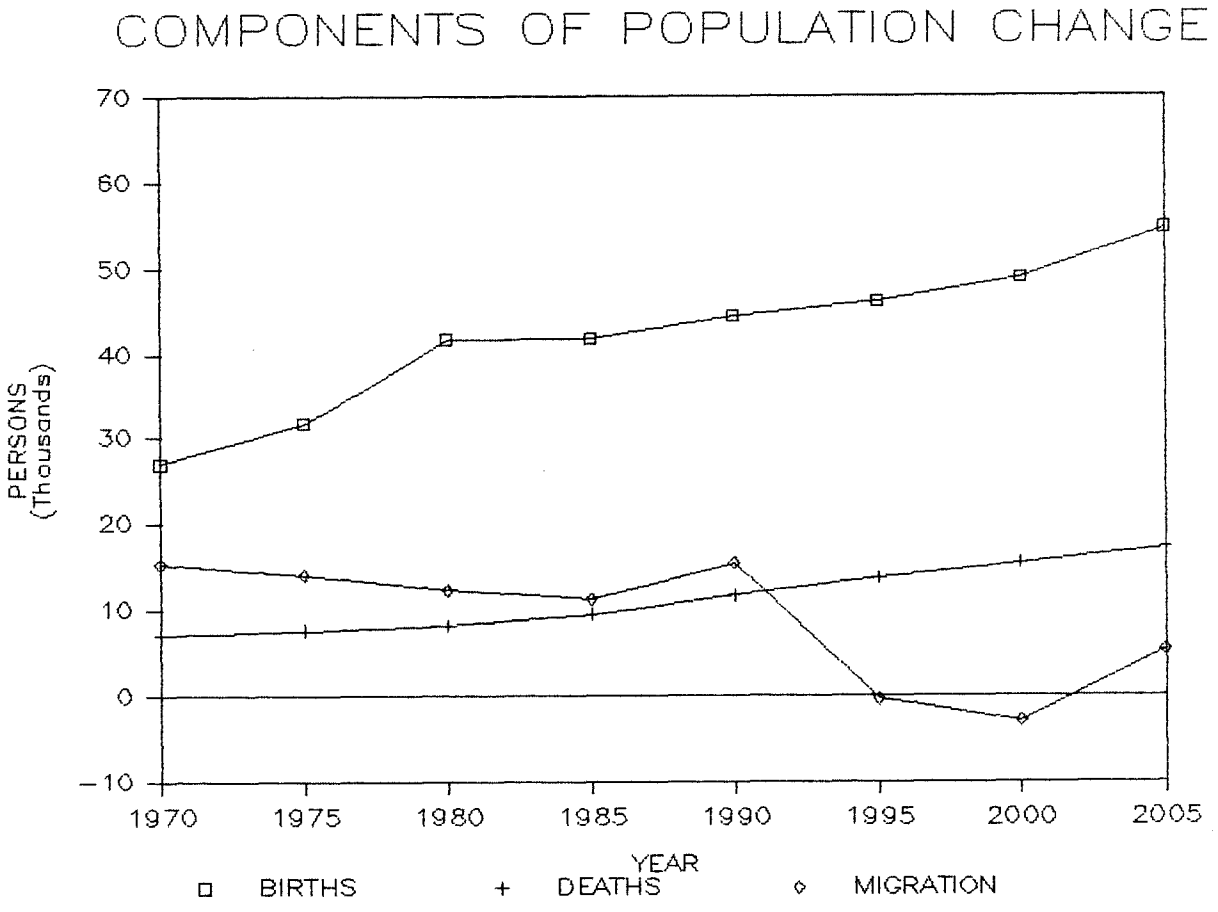


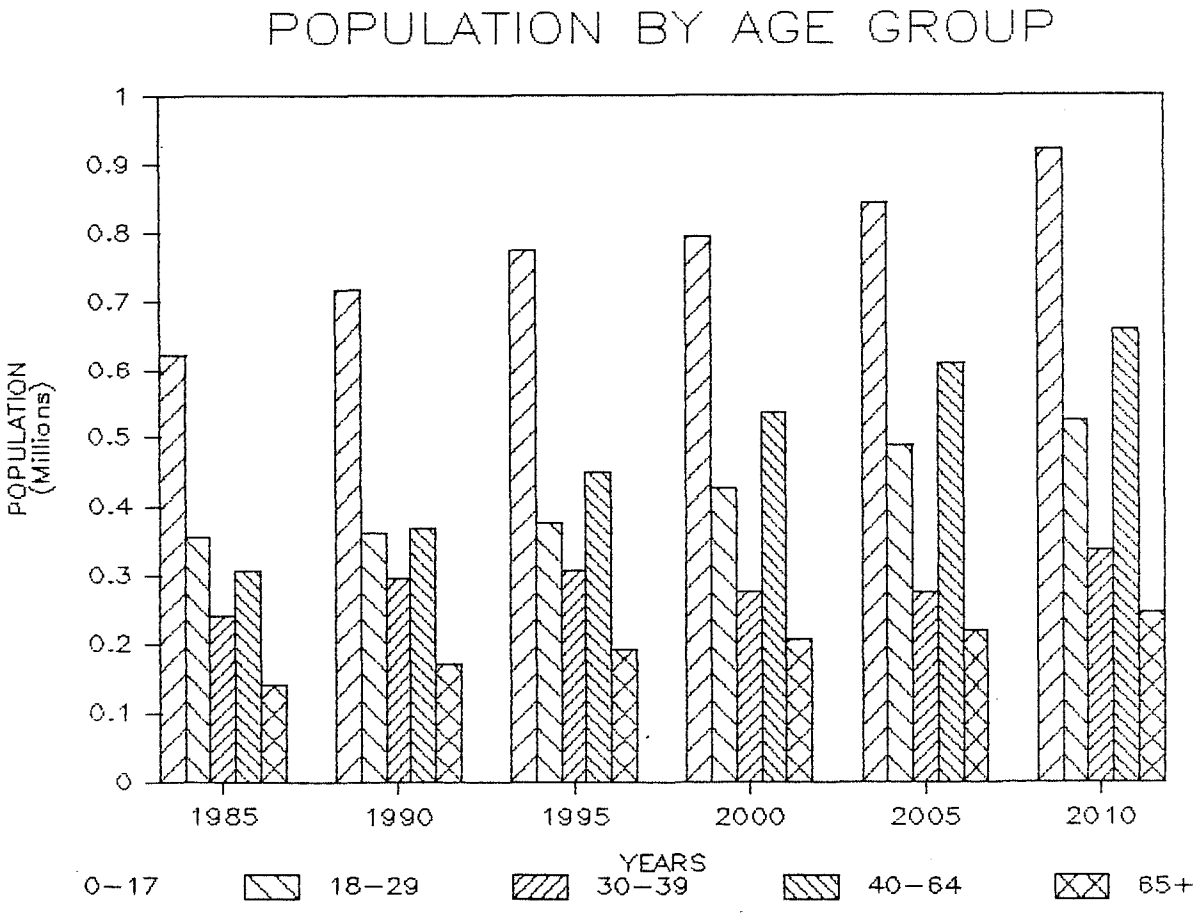
TABLE 3

STATE OF UTAH
POPULATION BY AGE GROUP

AGE GROUP	1970[a]	1980[a]	1990[b]	2000[b]	2010[b]
0-9	228977	336149	428203	455462	552312
10-19	240179	264584	351564	420476	455737
20-29	170026	290763	297691	345482	434990
30-39	111352	184866	295164	276676	334713
40-49	106501	120649	194318	289038	277250
50-59	89698	108546	120828	186545	280127
60+	112540	155480	224539	264990	345933

(a) These data represent Census information and therefore represent counts as of 1 April of the respective years. The projections are as of 1 July of the respective years.

FIGURE 3



School Age Population

Table 4 and Figure 4 indicate that the fifteen year period from 1980 to 1995 is projected to experience very rapid growth in school age population (kindergarten through twelfth grade). In 1995, there are projected to be 57 percent more school age children in the State than there were in 1980. This indicates an average yearly growth of over 13,200 potential students or an annual average growth rate of 3.0 percent per year. The 15 years after 1995 see much less rapid growth - averaging 0.9 percent per year, but the last five years of that period show the beginning of a major new wave of growth. Over the entire 30 year projection interval, school age population increases by 79 percent from 350,143 in 1980 to over 627,000 in 2010 for an average annual growth rate of 1.96 percent.

Household Formation

The number of households in the State is produced by applying age and sex specific household formation probabilities to each year's population. These probabilities are held constant over the projection interval. They produce an increase in total households in the State from approximately 448,600 in 1980 to just over 901,000 in 2010. This represents an annual average rate of change of 2.4 percent per year. This is a more rapid growth rate than for total population and reflects the aging of the population. Also reflective of the projected aging of the population is the slight decline in average number of persons per household from 3.2 in 1980 to 3.0 in 2010.

Labor Force Participation

One major link between the demographic and economic components of UPED is the extent to which persons of each age-sex group will be in the labor force (either are employed or are actively looking for a job). These proportions, called labor force participation rates (lfpr's) are assumed in Utah to follow national trends in each age-sex group and to move closer to projected national values over time. Table 5 and Figure 5 show the resulting aggregate trends in percentage of people 16-64 in the labor force for males and females from 1980-2010. Aggregate lfpr's for males are seen to remain roughly constant at between 89.7 and 86.5 percent of the working age male population. Female aggregate lfpr's are projected to follow nationally projected upward trends with resulting aggregates increasing from 58.26 percent in 1980 to 64.52 percent in 2010. The proportion of the labor force who are women is projected to increase from 39.4 percent in 1980 to 42.6 percent in 2010.

Employment

Table 6 and Figure 6 show total state employment increasing from 617,320 jobs in 1980 to 1,203,682 jobs in 2010. This increase of over 586,000 jobs represents an average annual growth rate of 2.25 percent, 0.25 percent higher than the state's projected population growth rate. This reflects the higher proportion of people in the labor force as discussed above. As is the case with population, employment growth does not occur at a constant rate over the projection interval. The employment growth rate peaks at 3.2 percent per year in the second half of the 1980's and declines thereafter to 1.89 percent per year in the 2000-2005 period. The 2005-2010 employment growth rate upturn is smaller than the 2000-2010 population growth rate upturn.

TABLE 4

STATE OF UTAH
SCHOOL AGE POPULATION

YEAR	SCHOOL AGE POPULATION	AVERAGE ANNUAL RATE OF CHANGE
1970	313052	0.0025
1975	315902	0.0025
1980	350143	0.0208
1985	417591	0.0359
1990	497795	0.0358
1995	548861	0.0197
2000	560132	0.0041
2005	581630	0.0076
2010	627301	0.0152

FIGURE 4

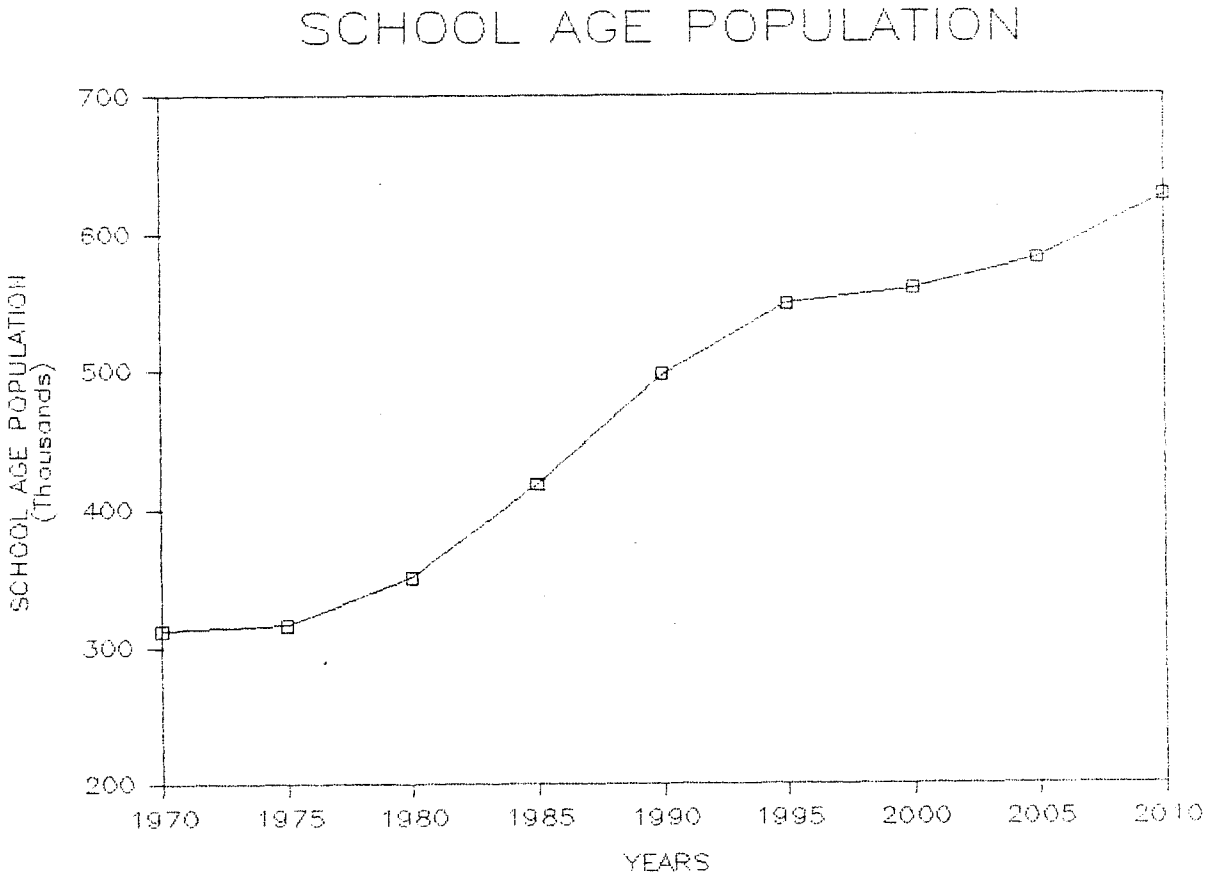


TABLE 5

STATE OF UTAH
MALE AND FEMALE
LABOR FORCE PARTICIPATION RATES

YEAR	MALES	FEMALES
1970	0.781	0.415
1980	0.8974	0.5826
1990	0.8792	0.6114
2000	0.8713	0.65
2010	0.8654	0.6452

FIGURE 5

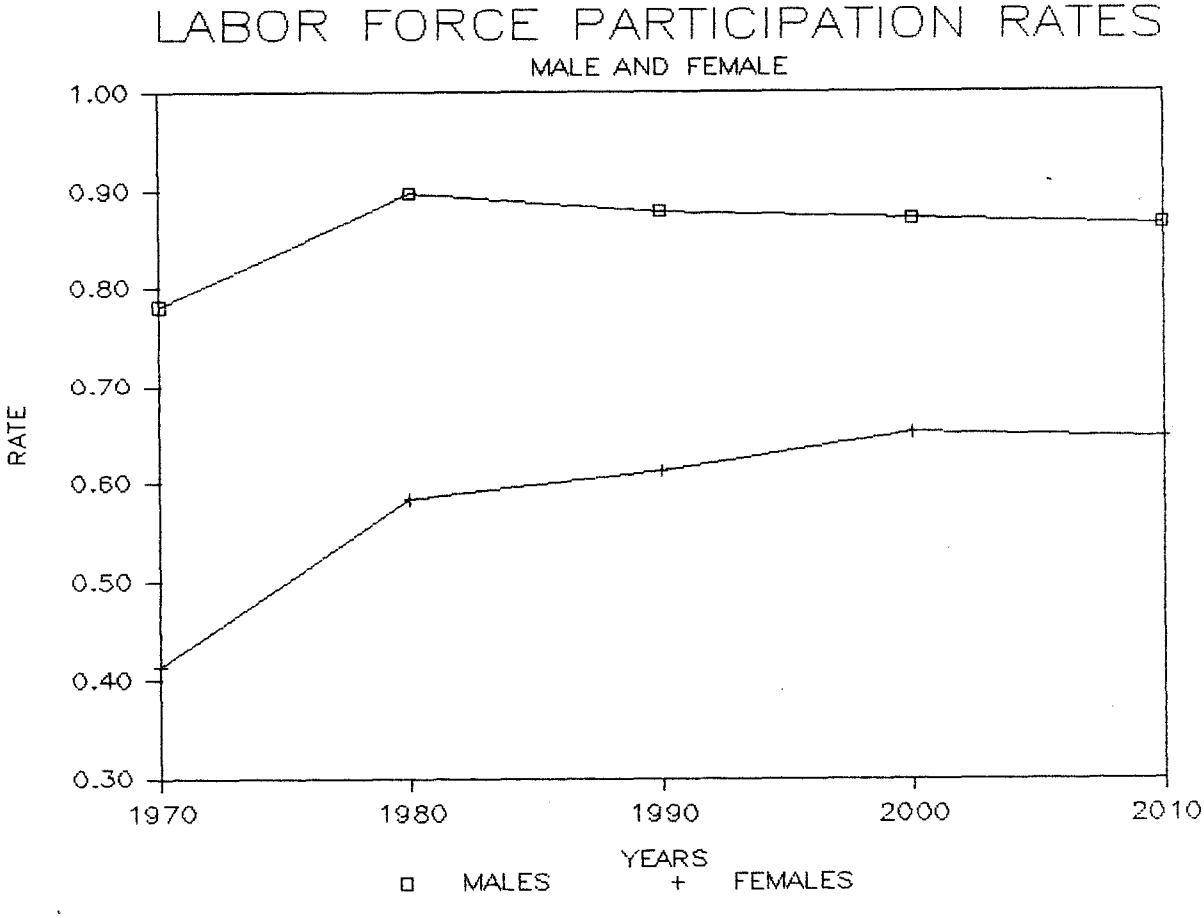


TABLE 6

STATE OF UTAH
TOTAL EMPLOYMENT*

YEAR	TOTAL EMPLOYMENT	AVERAGE ANNUAL RATE OF CHANGE
1970	415362	----
1975	499222	0.0375
1980	617320	0.0434
1985	687368	0.0217
1990	804073	0.0319
1995	910607	0.0252
2000	998412	0.0186
2005	1096383	0.0189
2010	1203682	0.0188

*Total employment includes non-agricultural wage and salary employment as well as all agricultural employment and non-farm proprietors.

FIGURE 6

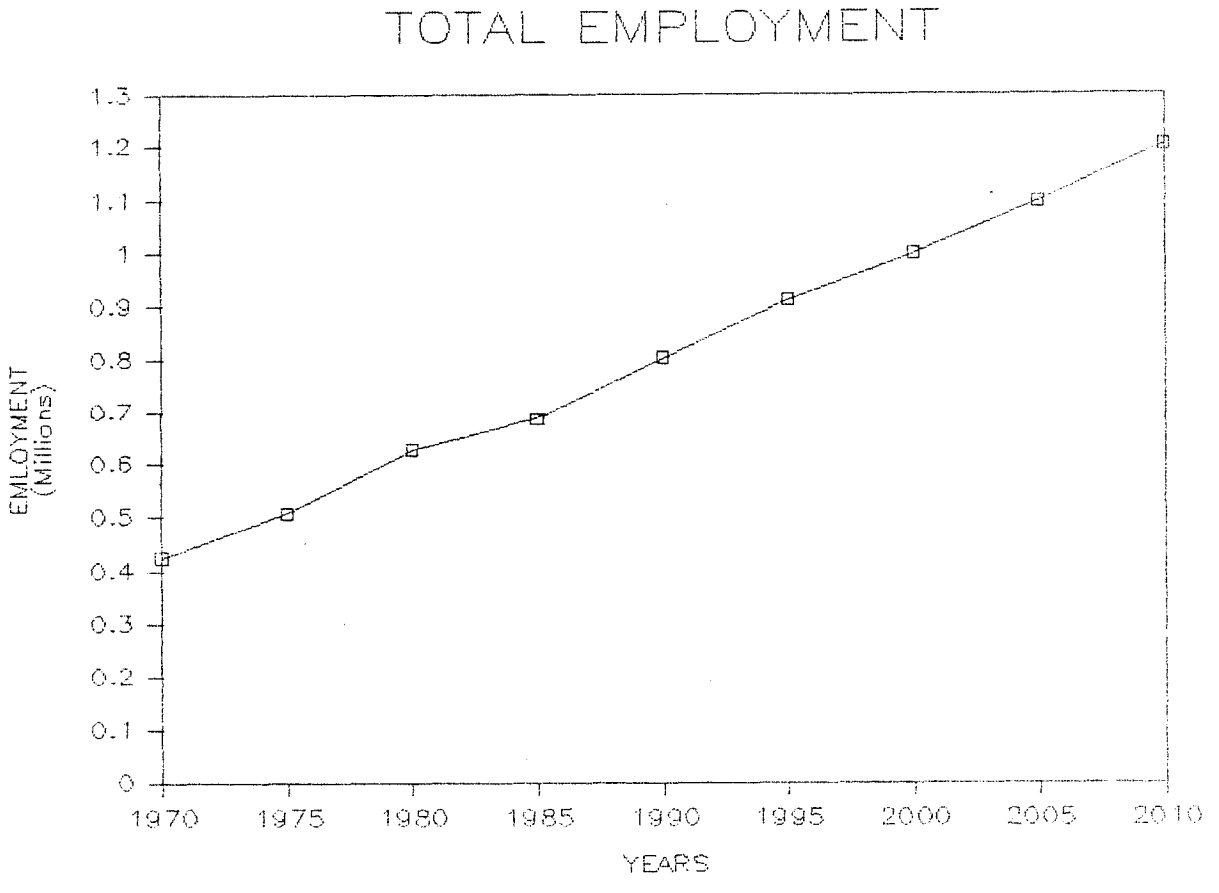


TABLE 7

STATE OF UTAH
TOTAL EMPLOYMENT BY INDUSTRY

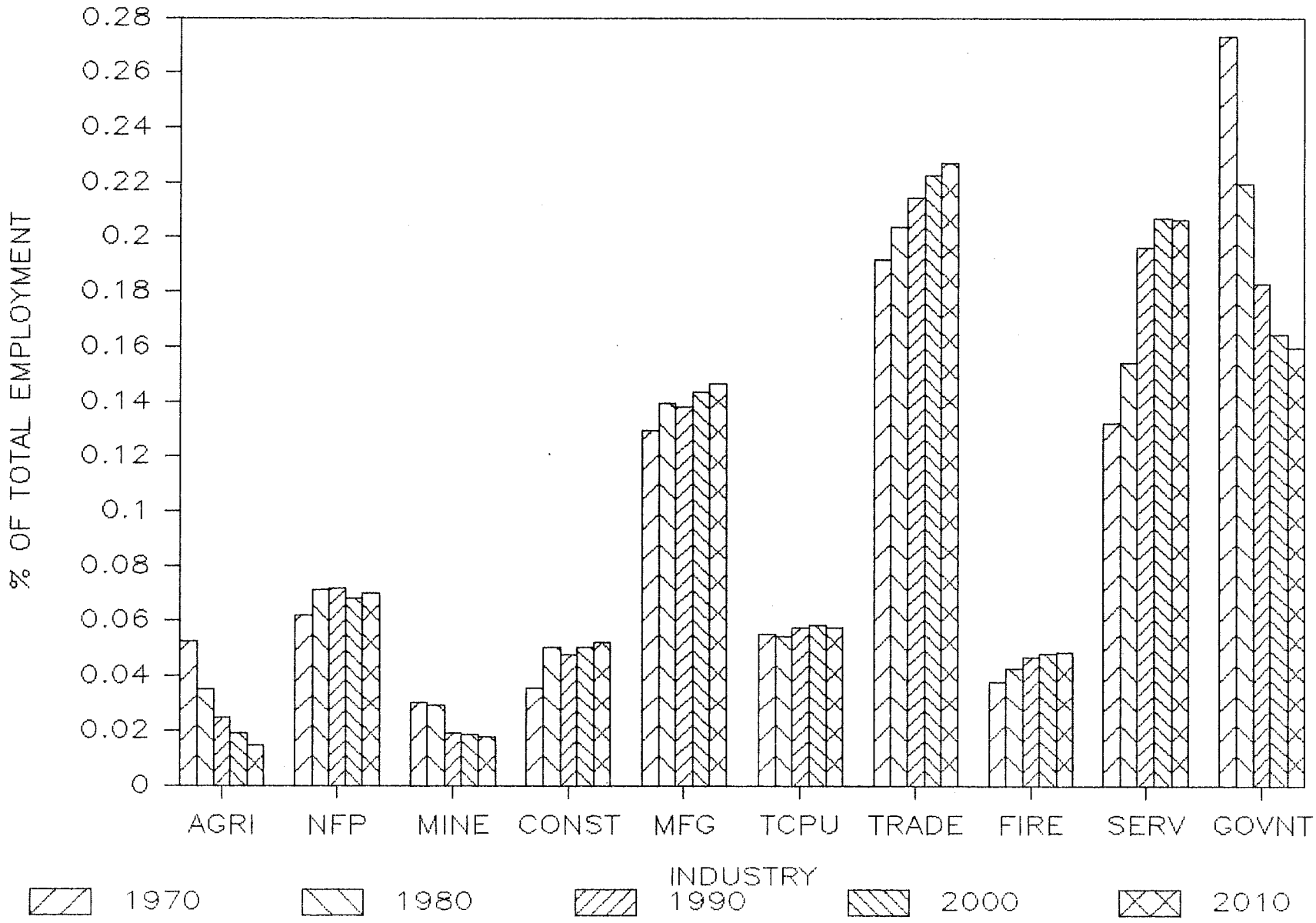
	1980		2010		1980-2010
INDUSTRY	NUMBER OF JOBS	PERCENT OF TOTAL	NUMBER OF JOBS	PERCENT OF TOTAL	AVG. ANNUAL RATE OF CHANGE
Agriculture	21,920	3.55	17,661	1.47	-.72
Mining	18,500	3.00	21,256	1.77	.46
Contract Const.	31,550	5.11	62,626	5.20	2.31
Manufacturing	87,700	14.21	176,474	14.66	2.36
TCPU*	34,120	5.53	69,249	5.75	2.39
Wholesale & Retail Trade	128,680	20.84	273,513	22.72	2.55
FIRE**	25,770	4.17	58,305	4.84	2.76
Services	99,430	16.11	248,383	20.64	3.10
Government	125,050	20.26	191,739	15.93	1.43
Non-Farm Proprietors	44,600	7.22	84,476	7.02	2.15
Total	617,320	100.0	1,203,682	100.0	2.25

*TCPU - Transportation, Communication & Public Utilities
**FIRE - Finance, Insurance, Real Estate

Table 7 and Figure 7 show the change in the industrial structure projected for Utah's job market. Agriculture, mining, and government are projected to decline as percents of total state employment with agriculture projected to continue its historical decline in total jobs and government showing the biggest proportional decline of almost six percentage points. The Wholesale and Retail Trade and Services sectors are expected to increase their proportions of total Utah jobs by 1.9 and 4.5 percentage points, respectively. The other sectors remain relatively constant as percents of the state totals. The overall pattern appears to be one of slight movement away from dependence on the state's traditional extractive-heavy manufacturing-government economic base and toward services and trade as driving sectors in the Utah economy.

FIGURE 7

INDUSTRY EMPLOYMENT



SUMMARY OF ASSUMPTIONS

Some of the major assumptions underlying Baseline 1984 have been discussed above:

o Constant age specific fertility rates at levels that continue Utah's 3.1393 average births per woman throughout her child-bearing years.

o Constant age specific mortality rates.

o Employment related migration concentrated in early adult ages with much fewer middle aged and older adults being likely to migrate.

o Constant age-sex specific household formation probabilities .

o Labor force participation rates trending toward the increasing national projections in each age-sex group with a 10.7% increase in overall female lfpr's and an increased proportion of the labor force made up of women.

The other two major categories of model driving assumptions concern (1) industrial sector specific basic employment assumptions and (2) the relationships between number of people living in the state and the number of "residentiary" jobs located in the state to serve their needs. As indicated in the appendix, UPED utilizes what is called the economic base method in its economic component. This method organizes economic activity (as measured by number of jobs in UPED) into two broad categories: (1) basic jobs, which produce commodities -- goods and/or services -- to be consumed by people living outside the study area, and (2) residentiary jobs, which produce commodities to be consumed by residents of the local economy. (Residentiary activity is frequently called "service" or "population-dependent" activity). The economic base theory argues that basic jobs provide the major driving force leading to economic growth or decline.

In UPED, each of over 60 industrial sectors (agriculture, coal mining, chemical manufacturing, etc.) are separated into basic and residentiary components. Basic employment is analyzed and projected outside the model and is "fed" to the model as a major input. Residentiary employment, on the other hand, is produced within the model as a function of the number of people projected to be in the study area and of other inputs to the model.

Residentiary Employment

The major assumptions determining the number of residentiary jobs per resident, for each sector, are: (1) the number of jobs in that sector in the nation as a whole, (2) a corresponding national population projection, and (3) a projection of the relationship between national sector-specific employment per capita and sector specific residentiary employment per capita in the study area. National-level employment and population projections are developed from federal governmental agency projections. The national population projections (with sex and single year of age detail) is the Series 14-Middle Series projection produced by the Bureau of the Census. The national employment projections are adapted from series produced by the Bureau of Labor Statistics and the Bureau of Economic Analysis, agencies of the Departments of Labor and Commerce, respectively.

Base year estimates of the parameters relating to national and study area employment per capita are produced for each sector in initial calibration analyses. The critical question is whether these parameters should be expected to change over time. An increase would imply that the study area is becoming more self-sufficient in providing itself with the goods and services provided by the sector experiencing the increase. This phenomenon is known as "import substitution." A decrease, on the other hand, would imply that the study area is becoming more dependent on outside sources of supply for such commodities.

There appears to be no reason to expect such import relation-type structural changes to occur in any of the state's MCD's in Baseline 1984. Thus, the 1983 estimates of the relationships between study area and national level residentiary employment per capita relationships are held constant for all industrial sectors in all MCD's. As should be expected, the metropolitan MCD's (Wasatch Front and Mountainland) have higher values than the less self-sufficient rural MCD's.

One result of this assumption is the relative constancy of the "economic base multiplier" (i.e., total employment divided by total basic employment) over the projection interval. At the state level, the multiplier was estimated at 2.1 in 1983. By 2010, this value increases to 2.2. This slight increase results primarily from the slightly higher concentration of people and jobs in the metropolitan MCD's. The MCD-level 1980 multipliers implied by the Baseline 1984 calibration vary from 1.8 in the Uintah Basin to 2.2 in the Wasatch Front.

It must be emphasized that in many applications of UPED projecting the impacts of very large scale economic developments will require changing assumptions to reflect increased self sufficiency resulting from a major increase in the size of an MCD's internal market. For example, such an adjustment would be required to properly project the impact in the Uintah Basin of the thousands of permanent basic jobs that would be created in that MCD if a full scale oil shale industry were to be developed. The UPED Model is built to accommodate such analytical requirements routinely.

Basic Employment

Basic employment estimates by sector for each MCD for the year 1983 were produced as part of the initial calibration process. A major analytical and judgmental effort was subsequently carried out to project the future growth and/or decline of these figures through 2010. Two different approaches were adopted and their results were combined to produce the basic employment projections upon which Baseline 1984 is based.

Statistical Analysis

The first approach is based upon statistical analysis of historical employment data. Seven different statistical models were specified as alternative hypothetical "explanations" of sector and MCD-specific employment histories. Historical employment data were fitted to each of the seven models. Several of the models attempted to use relationships of MCD to national employment levels. National forecasts by industry were then used to forecast MCD employment by industry. The results of each model were then

evaluated for goodness of fit and reasonableness of the basic employment projections produced by extending each model through the year 2010. For most sectors in most MCD's, one of the seven models provided both a good "explanation" of historical experience and a reasonable projections of future basic employment growth or decline.

Judgment - Special Knowledge

In many cases, however, dramatic alterations from past trends are virtually certain to occur over the next 30 years. No statistical analysis of past history can reveal or capture the magnitude of such changes. Thus, a second, judgmental approach to basic employment projections was also carried out. Listings of potential major economic developments, including descriptions of their probable timing and employment levels, were developed for each MCD by local-level planners and officials with the cooperation and assistance of state-level analysts. These lists were subjected to intense review and analysis. This process focused on three aspects of each event listed: (1) the likelihood of its actually occurring; (2) the basic, as opposed to residentiary, nature of the activity; and (3) the extent to which the event represents a real break from past trends as opposed to being the likely specific events constituting the growth (or decline) implications of the statistical analyses described earlier.

Major economic developments which were found to be highly likely to occur, which are basic in nature, and which represent clear changes from past trends were built into the Baseline 1984 basic employment projections. In some cases, the jobs associated with these developments were either added to or subtracted from the projections developed in the statistical analyses. In others, the development was of such generality and magnitude that it was used to replace the statistical analysis projections entirely. Table 8 lists for each MCD the major events selected for inclusion in Baseline 1984's basic employment projections.

TABLE 8
MAJOR ECONOMIC EVENTS INCLUDED IN
BASELINE 1984

MCD	EVENT	BEGINNING YEAR
Bear River	1. Thiokol buildup - defense manufacturing	1984
	2. Closure of Intermountain Indian School	1984
	3. Opening of Weston Grain & Agri Fuels - ethynol fuel plant	1985
	4. Lazy Boy expansion - furniture manufacturing	1984
Wasatch Front	1. Kennecott Copper Corp. - employment held constant at 1984 level after layoffs	1984
	2. Great Salt Lake Minerals - metal production; employment held constant at 1984 level after layoffs	1984
Mountainlands	1. Stouffers Food - opening of food production plant.	1985
	2. Geneva - primary metal production. Employment held constant at 1984 level after layoffs	1984
	3. IPP Rail facility (Springville)	1986
Central	1. IPP Construction - construction of Intermountain Power Project	1982
	2. IPP Operations - operations of Intermountain Power Project	1984
Southwest	1. Brian Head and Crystal Mountain recreation development	1985
	2. UP&L Geothermal plant - electricity generation	1985
	3. Sulphurdale Geothermal plant - electricity generation	1985
	4. Quail Creek Dam - construction	1985
	5. Automated Flight Service Center - federal public administration	1985
	6. Cedar Products expansion - furniture manufacturing	1985
	7. Assorted hotels and lodging - openings and expansion	1985
Uintah Basin	1. Bonanza Power Plant - construction phase down	1984
	2. Bonanza Power Plant - operations - electricity generation	1984
	3. Chevron Phosphate Slurry Line	1985
Southeast	1. UP&L Hunter 3 power plant construction phase down	1983
	2. Various coal projects - coal production	1985

PRELIMINARY COUNTY DISAGGREGATIONS

Regional population totals projected by the UPED model have been disaggregated to the county level. (see Table 9 and Figure 9). These county level projections are however, provisional until the Spatial Allocation Model (SAM) is re-calibrated to better allocate regional projections to the county level. These disaggregations were developed by working with local planners from the Associations of Governments and county planning offices. Some AOG's developed their own allocation models; others were developed by OPB. In some cases the county allocations represent only small modifications of distribution patterns represented by previous SAM allocations.

Also various regression techniques were used to independently forecast all county populations to assure these county projections were within a reasonable range which could be explained by historical trends. This was the case in all counties with the exception of Morgan County. Morgan County, the projected fastest growing county in the state, has an abnormally high annual rate of almost 6%, which is much higher rate than has been experienced historically. The projection results from a distribution model developed by the Wasatch Front Regional Council. They anticipate rapid growth in Morgan, not necessarily resulting from industrial development, but from the development of Morgan County as a bedroom county serving employment located in Davis and Weber Counties. This same trend, but to lesser degree, is anticipated for Tooele County.

To reiterate, these county projections are not the result of a consistent allocation model or procedure, but instead represent consensus projections of the state and local planners. These projections used a variety of allocations techniques but most importantly, utilized local knowledge and judgment of city, county and regional planners

These projections indicate that Morgan, Tooele, Summit, and Washington counties, will be the fastest growing counties in Utah respectively over the next 25 years. The slowest growth is projected to occur in Grand, Garfield, Daggett, Beaver and Emery counties respectively. Some of these counties are still recovering from major economic downturns and will it take some time to reverse the trends of decline. Significant economic growth trends and/or baseline economic development projects simply cannot be identified in these counties.

TABLE 9
UTAH BASELINE PROVISIONAL POPULATION PROJECTIONS*
DECEMBER 1984
1980-2010

YEARS	1980	1983	1985	1990	2000	2010	ANN % CHG
BEAR RIVER	93350	101550	106500	121200	139900	163600	1.89%
BOX ELDER	33500	35300	36700	42350	50000	60000	1.96%
CACHE	57700	64000	67500	76400	87250	100600	1.87%
RICH	2150	2250	2300	2450	2650	3000	1.12%
WASATCH FRONT	948950	1012000	1058200	1230200	1490700	1803000	2.16%
DAVIS	147900	160800	172000	217500	285300	346000	2.87%
MORGAN	4950	5300	6200	8900	16100	24400	5.46%
SALT LAKE	624500	666000	691800	786400	912600	1099000	1.90%
TOOELE	26200	27000	30000	39000	52750	68300	3.25%
WEBER	145400	152900	158200	178400	223950	265300	2.02%
MOUNTAINLANDS	239400	261250	271300	309700	326900	379100	1.54%
SUMMIT	10350	11700	12550	15100	19600	26300	3.16%
UTAH	220400	240700	249600	284500	295800	338800	1.44%
WASATCH	8650	8850	9150	10100	11500	14000	1.62%
CENTRAL	47500	53100	63600	67600	72000	85000	1.96%
JUAB	5550	5850	6900	6900	7800	9300	1.74%
MILLARD	9050	11250	17700	15400	16300	19000	2.50%
PIUTE	1350	1500	1650	1800	1900	2000	1.32%
SANPETE	14750	16700	18000	20700	21500	24700	1.73%
SEVIER	14850	15650	17050	20300	21700	27000	2.01%
WAYNE	1950	2150	2300	2500	2800	3000	1.45%
SOUTHWEST	56050	62550	65600	72800	87200	107500	2.19%
BEAVER	4400	4950	5100	5150	5350	5900	0.98%
GARFIELD	3700	3950	4050	4100	4250	4650	0.76%
IRON	17450	18600	19350	21400	25600	31400	1.98%
KANE	4050	4250	4400	4700	5500	6800	1.74%
WASHINGTON	26450	30800	32700	37450	46500	58750	2.70%
UINTAH BASIN	34100	39450	40700	46700	51700	60300	1.92%
DAGGETT	750	800	850	850	900	950	0.79%
DUCHESNE	12650	14050	14750	16900	18600	21450	1.78%
UINTAH	20700	24600	25100	28950	32200	37900	2.04%
SOUTHEAST	54650	57600	59700	64200	70300	82600	1.39%
CARBON	22350	24000	25100	27800	31200	39300	1.90%
EMERY	11650	12750	13400	13700	14500	15700	1.00%
GRAND	8250	7950	7800	8050	8800	10000	0.64%
SAN JUAN	12400	12900	13400	14650	15800	17600	1.17%
STATE TOTAL	1474000	1587500	1665600	1912400	2238700	2681100	2.01%

These numbers represent estimates & projections as of 1 July of each year.

FIGURE 9

POPULATION CHANGE
1980-2010 ANNUAL AVERAGE

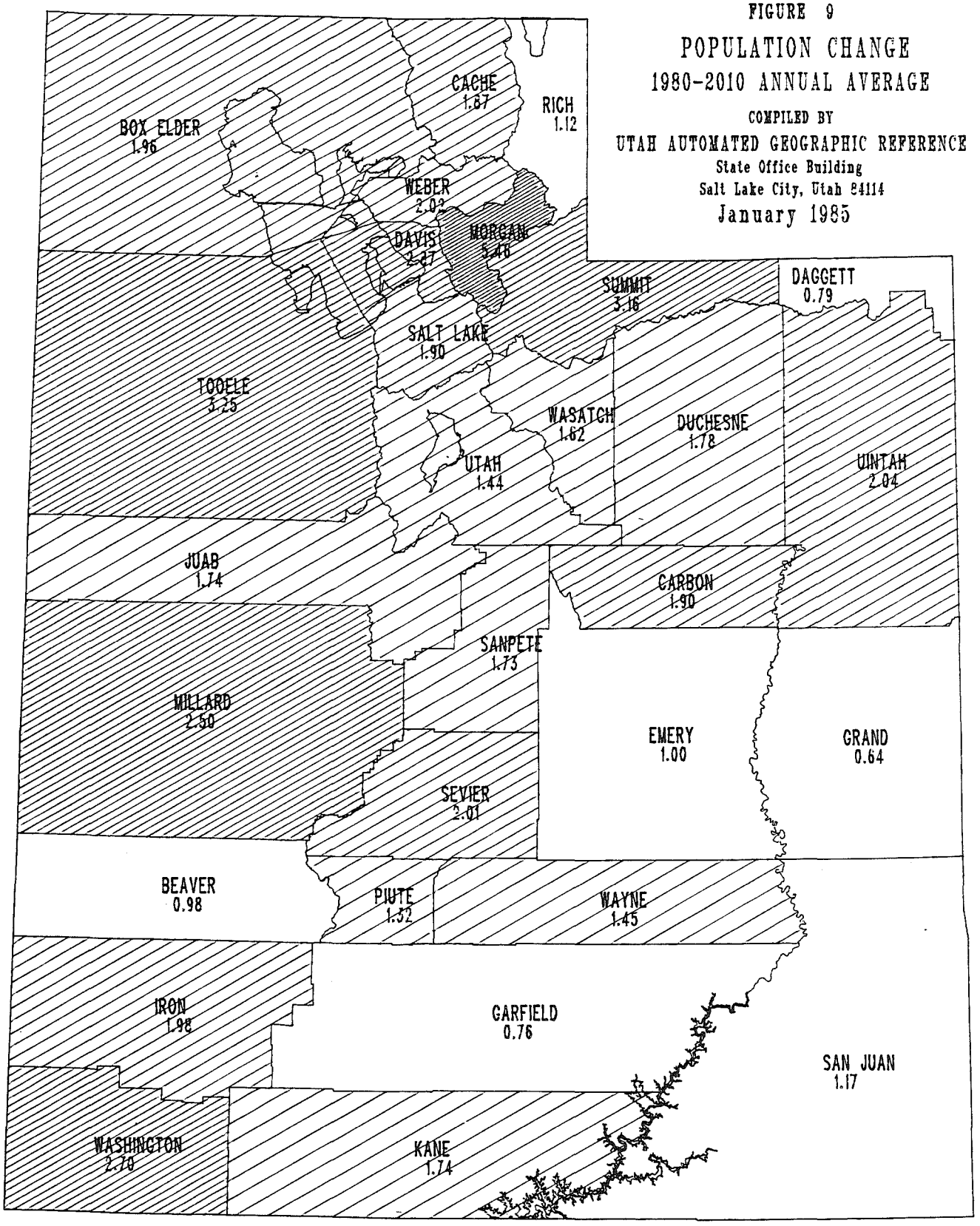
COMPILED BY

UTAH AUTOMATED GEOGRAPHIC REFERENCE

State Office Building

Salt Lake City, Utah 84114

January 1985



EXPLANATION

- 3.4% - 5.5%
- 2.5% - 3.3%
- 1.9% - 2.4%
- 1.3% - 1.8%
- 0.0% - 1.2%

PRIMARY SOURCE MAP:
U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS, 1980

POPULATION DATA:
UTAH OFFICE OF PLANNING AND BUDGET
DATA RESOURCES SECTION

CONCLUSIONS

From the foregoing, it can be seen that Utah can expect to continue to experience relatively rapid growth through the rest of the 20th century and well into the 21st. The growth rate in Utah will be more than twice the growth projected for the nation. Growth in Utah will not, however, be evenly distributed across the state. In particular, the historically natural resource dependent rural counties face the prospect of not being able to provide adequate jobs to employ all of their young people as they age into the labor force. Indeed, for several years around the turn of the next century, the entire state will experience out-migration as a result of inadequate employment opportunities. The overall state-level picture for most years, however, is one of adequate job growth to meet Utahns' employment needs and of continued in-migration. The geographic distribution of these jobs, however, will probably require migration within the state from the slower growth MCD's to those which are growing more rapidly, particularly the metropolitan counties.

These expectations, as expressed in Baseline 1984, are, of course, based on a set of crucial assumptions about future economic and demographic behavior. These assumptions are summarized and discussed earlier in this report. They represent a consensus best effort of a large number of planners, officials, and analysts at both state and local levels. They are certainly plausible and reasonable as viewed at this point in time. Nonetheless, as all users and producers of such projections are constantly aware, some of them will prove to be wrong -- some badly wrong. The future course of such events is inherently and irreducibly uncertain. The projections program of the Data Resources Section is designed to respond to this uncertainty in two major ways:

(1) Baseline projections have been updated from time to time to incorporate new data as it became available, and new major economic development possibilities are recognized. Baseline 1984 is the latest in this series of Baseline projections. A regular program of review and update on a yearly basis is now in place to insure that Baselines are kept current.

(2) The Section's projection models (UPED is one of these) are built to facilitate analysis of the economic and demographic impacts of major developments not included in the current Baseline projections. How many more people will be in the Central MCD if the third and fourth units of IPP are built? When will they arrive and how long will they stay? How many more school children will the school district be required to educate? How many more trade and service jobs will be created and how long will they last? To what extent will continuing the present IPP practice of housing a large portion of their construction work force in more or less self contained commuter camps mitigate the boom-town impacts to be expected from a "laissez faire" housing policy? On the other hand, how many fewer people would live in the Mountainland MCD if the Geneva Steel Plant were to phase down? To shut down completely? What would be the economic and demographic details of these reductions?

The UPED Model has been used by the Section to analyze the prospective impacts of literally hundreds of such potential projects over the years. Some analyses have been done on the Section's own initiative, some have been done for and at the request of various state, local, and federal governmental

agencies, and many have been done for private sector clients such as project sponsors, their planning consultants, or preparers of environmental impact statements. (Model runs for state and local governmental agencies are done at Section expense. Runs for federal governmental agencies and private sector clients are done on a cost reimbursement basis.)

An excellent track record has been established and UPED analyses are now virtually required elements in major project impact planning in the state. The Data Resources Section is committed to continuing to provide this vital analytical support for impact planning and mitigation in the future. Serving as the basis for such impact analyses is one of the major uses to which Baseline 1984 (and all subsequent Baseline projections) will be put.

As mentioned earlier, a more complete report is forthcoming with considerable more detailed information needed for planning efforts. This report will include some county projections as well as more age and sex detail at the MCD level. Until this report is available, more detail can be obtained by contacting the Data Resource Section, Utah Office of Planning and Budget. (533-6082). Also the Data Resources Section will be re-calibrating the Spatial Allocation Model (SAM) to derive still better geographic detail. Once this model is recalibrated, projections of population and employment by industry will be available at the County Census Division (CCD) level. This effort should be completed in the next 4-5 months. Also the Data Resource Section will be working with the Bureau of Economic and Business Research and the Utah Office of Education, to produce county and school district projections by age and sex. This project is scheduled to be completed by June, 1985. Thus, within the next seven months, baseline projections will be available at whatever detail is necessary to accommodate planning needs.

APPENDIX

THE UTAH PROCESS ECONOMIC & DEMOGRAPHIC MODEL (UPED)

The Utah Process Economic and Demographic Impact Simulation Model (UPED) is the official model used by the Office of Planning and Budget to project population and employment growth in the state. * UPED is a hybrid of two standard population and economic projection methodologies: (1) the cohort survival model and (2) the economic base model. In the three-component, cohort survival population model, future population levels are projected from base year figures by adding births, subtracting deaths, and adding net in-migration or subtracting net out-migration. The values of each of the three components of population change (births, deaths, and migration) are projected as a function of the initial year values and the resultant increments are added or subtracted to generate the first projection year's values. The process is then repeated to generate the second projection year's values and so on to the last projection year. The population is disaggregated into appropriate sub-groups, called cohorts, whose values are projected over time. In UPED, sex and single year of age cohorts are used. Through the projection years, of course, each cohort ages and its behavior with respect to demand for goods and services, labor force participation, fertility, mortality, and geographic mobility varies with the aging process.

According to the economic base concept, for all but the largest (national-continental regions), the primary determinant of the level of economic activity, and consequently of population size, is the amount of goods and services produced for export to other areas. Increases or decreases in basic (export) employment produce corresponding changes in the number of households deriving their income from these sectors. These changes, in turn, produce changes in the demand for goods and services produced locally for the local consumption. (These local production-local consumption activities are referred to variously as non-basic, service, residentiary, or population dependent sectors). Initial changes in population dependent sectors in turn, produce changes in population and in household incomes which generate further changes until, finally, a given projected initial change in basic sector employment will produce a "multipliered" change in population dependent and local employment as well as in population.

In UPED, the economic base methodology is adapted to affect population projection through the migration component. Population projections, in turn, generate residentiary employment for each level of basic employment. Thus, the cohort survival and economic base methodologies are combined in UPED to form a complex systems model. The workings of the UPED Model and of its key data requirements are presented in Figure A-1. The top three boxes represent the natural increase (births and deaths), again, and the non-employment related part of the migration components of UPED's population project methodology.

The initial (Year t) population, consisting of a census-type count or estimate of all people residing in the area by age and sex is adjusted to reflect the temporary absence of some individuals who are permanent residents (an increase) and/or the temporary presence of individuals who are not

*Rodger Weaver, et.a., UPED79, Bureau of Economic and Business Research, College of Business, University of Utah and Utah State Planning Coordinator's Office, Salt Lake City, Utah, 1980.

permanent residents (a decrease). Relevant categories here include college students, military, and LDS missionaries. The resultant estimate of the permanent resident population is then survived by applying cohort specific survival rates. The result is the subset of the initial resident population expected to still be alive the next year. Members of each cohort have aged one year. The aged-survived population is adjusted to reflect projected levels of temporary absence (a decrease) or presence (an increase) and permanent non-employment related in-(increase) and out-(decrease) migration. Total births are projected by applying a vector of age specific birth rates to the female component of this adjusted aged-survived population. Infants' sex composition and infant mortality are also projected at this stage. The result of these calculations, as shown in Box 3, is the Adjusted Natural Increase Population at Year t+1, which becomes the initial estimate of population in that year (Box 4).

This first approximation population projection is the source of two elements of Labor Market Analysis: (1) the initial (pre-employment related migration) Labor Force and (2) initial Population Dependent Job Opportunities at Year t+1 (Boxes 5 and 6, respectively). The Labor Force is derived by applying projected age and sex specific labor force participation rates to the projected population. The projected participation rates are dependent upon both extrapolations of their secular trends and year-to-year changes in area economic opportunity.

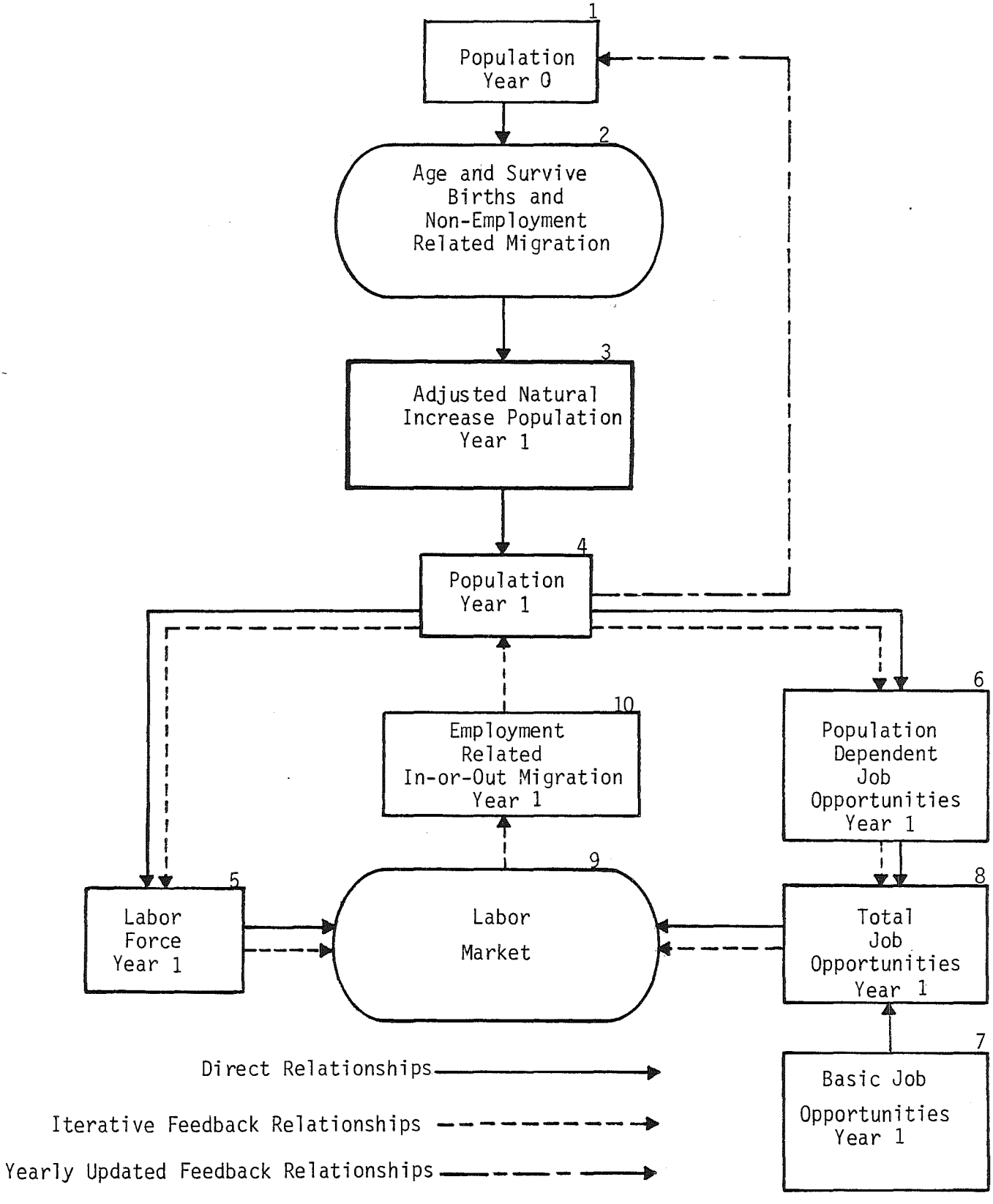
Population dependent job opportunities are projected as dependent upon (1) the size and age composition of the population, (2) projected sector specific ratios of area per capita residentiary employment to national employment per capita, and (3) projections of national residentiary employment by sector and/or national population by cohort. Thus, changes in the size and/or demographic composition of the population, in the capability of the area to produce goods and services for its own consumption, and/or national economic and demographic conditions can all influence the projection of each sectors population dependent job opportunities. The most critical operational assumptions here are the local-national per capita residentiary employment relatives. Of special importance is the ability to adjust these assumptions to reflect structural changes as market expansion leads to import substitution possibilities.

As Box 7 indicates, basic employment demand is exogenously projected by sector and treated parametrically in UPED. These projections of basic employment are varied to reflect the different economic developments to be analyzed. For example, to project the impacts of a particular power plant, the direct basic employment by industrial sector involved in constructing and operating the plant would be added to a baseline basic employment projections and the sum would serve as the basic job opportunities input for that power plant's UPED run.

Basic and population dependent job opportunities are summed to produce Total Job Opportunities at Year t+1 (Box 8). This, initial value for both the supply of and demand for labor are introduced into the Labor Market component of UPED, where they are used to calculate the projected unemployment rate as an index of the area's economic opportunities. This rate is compared against a parametrically established "normal" range of unemployment rates. If it is higher than the upper bound of the range--the out-migration triggering

SIMPLIFIED GENERAL FLOW CHART

UPED MODEL



rate--this is taken to indicate inadequate opportunities for the natural increase population and Employment related Out-Migration at t+1 is projected. Alternatively, if it is below the lower bound--the in-migration triggering prosperity is indicated and Employment Related In-Migration at Year t+1 is projected.

The amount of migration projected is sufficient to provide the labor force required to adjust the unemployment rate to the relevant triggering rate, assuming no change in population dependent job opportunities. The demographic detail of this migration reflects cohort difference in (1) labor force participation rates, (2) migration propensities, and (3) the composition of the source population (local population for out-migration, national population for in-migration).

Of course, the assumption stressed in the previous paragraph, that job opportunities do not change as a result of migration, is invalid. The migration of workers and their families either increases or decreases population dependent job opportunities. This first round migration will prove insufficient to adjust the unemployment rate to the relevant bound of normal range, and further migration in the same direction must be projected. The short dash arrows in Figure A-1 indicate the interative nature of the UPED solution to this inter-dependence problem. The iterative process continues until the calculated unemployment rate is satisfactorily close to the relevant triggering rate, at which time solution is achieved and no further migration or employment changes are calculated. Final population, migration, and employment outputs are presented with the former being used to derive projections of households, labor force, and school age population. The solution value for projected population is then fed back into the Model (long dash arrow in Figure A-1) to serve as the initial population vector for the next projection year.